

# Field Service Instruction

Part Number: 4116707  
Rev: A  
Date: 7 November 2000

## **Conversion Instructions: Incubator 8000 Analog PCB**



## **Recall Incubator 8000 series in the USA and Canada**

### **Conversion Instructions Analog PCB for Field Service and Feedback Form**

**Dear Customer,**

You have received a repair kit for your Incubator 8000 series. Please read all Conversion Instructions before you start the modification and use the Feedback Form on page 6 to inform us about the device you have upgraded.

As a medical device manufacturer we are required to report the results of the corrective action to the FDA and Health Canada, therefore a feedback form must be completed for each Incubator modified. If you have any questions, please feel free to call Dräger Medical, Inc. at 1 800 4 DRAGER and ask for Service.

Sincerely,

Andreas Lenke  
Technical Product Manager  
DrägerService

#### **1 Action to be taken:**

- Installation of a modified Analog PCB.
- Installation of a new Software Version on units delivered prior to 1999.
- Follow up validation of replacement of CPU Incubator PCB according to TSB Incubator 8000 IC/SC/NC # 12.
- Disconnection of the auxiliary fan on the Power Pack PCB according to TSB Incubator 8000 IC/SC/NC # 17.
- Retrofitting of 2 warning labels according to TSB Incubator 8000 IC/SC/NC # 19.

## 2 Parts needed for Conversion in the USA and Canada

### 2.1 For Incubator 8000 IC with ThermoMonitoring and SW 21.n:

On units with ThermoMonitoring the sockets for the two skin temperature sensors are located on the left side of the blue housing of the Incubator.

P/N 4116706-001, Contents of delivery:

- 1 piece Analog PCB P/N 2M 22 404, P/N 2M 22 405, P/N 2M 22 406, P/N 2M 22 407, P/N SE 2M 22 404, P/N SE 2M 22 405, P/N SE 2M 22 406, SE 2M 22 407, or 2M 22 382, or SE 2M 22 382
- 1 piece EPROM Software version 21.02, P/N 2M 22 331
- 1 piece Label P/N 2M 22 384
- 2 pieces label P/N 2M 22 351
- Conversion Instructions (see list of documents in section 3)

### 2.2 For Incubator 8000 IC without ThermoMonitoring and SW 20.n

On these units the socket for the skin temperature sensor is connected in the sensor module.

P/N 4116706-002, Contents of delivery:

- 1 piece Analog PCB P/N 2M 22 400, P/N 2M 22 401, P/N 2M 22 402, P/N 2M 22 403, PCB P/N SE 2M 22 400, P/N SE 2M 22 401, P/N SE 2M 22 402, P/N SE 2M 22 403, 2M 22 381, or SE 2M 22 381
- 1 piece EPROM, Version 20.04, P/N 2M 22 327
- 1 piece Label P/N 2M 22 384
- 2 pieces label P/N 2M 22 351
- Conversion Instructions (see list of documents in section 3)

### 2.3 For Incubator 8000 NC/SC without ThermoMonitoring and SW 10.n

On these units the socket for the skin temperature sensor is connected on the backside of the Incubator.

P/N 4116706-003, Contents of delivery:

- 1 piece Analog PCB P/N 2M 22 400, P/N 2M 22 401, P/N 2M 22 402, P/N 2M 22 403, PCB P/N SE 2M 22 400, P/N SE 2M 22 401, P/N SE 2M 22 402, P/N SE 2M 22 403, 2M 22 381, or SE 2M 22 381
- 1 piece EPROM, Version 10.05, P/N 2M 22 326,
- 1 piece Label P/N 2M 22 384
- 2 pieces label P/N 2M 22 351
- Conversion Instructions (see list of documents in section 3)

### 2.4 For Incubator 8000 SC without ThermoMonitoring and SW 11.n:

On units with SW 11.n the socket for one skin temperature sensor is located on the left side of the blue housing of the Incubator.

P/N 4116706-004, Contents of delivery:

- 1 piece Analog PCB P/N 2M 22 404, P/N 2M 22 405, P/N 2M 22 406, P/N 2M 22 407, P/N SE 2M 22 404, P/N SE 2M 22 405, P/N SE 2M 22 406, SE 2M 22 407, or 2M 22 382, or SE 2M 22 382
- 1 piece EPROM, Software version 11.02, P/N 2M 22 332
- 1 piece Label P/N 2M 22 384
- 2 pieces label P/N 2M 22 351
- Conversion Instructions (see list of documents in section 3)

### 3 Attached documents for conversion:

- Skin-Temperature Measurement Conversion Instructions (Incubator 8000 IC/SC/NC)"
- TSB Incubator 8000 IC/SC/NC # 12
- TSB Incubator 8000 IC/SC/NC # 17
- TSB Incubator 8000 IC/SC/NC # 19
- Adhesive statement 2M22363 (according to TSB Incubator 8000 IC/SC/NC # 19)
- Incubator 8000 IC/SC/NC, Electrical Safety Test in the USA and Canada according to CAN/CSA - 22.2 No. 601.1 - M90

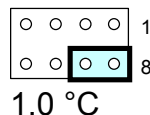
### 4 Conversion Instructions for Units in the USA and Canada

- 4.1 Please fill out the feedback form during the modification. Some of the data is on the parts that will be installed.
- 4.2 Observe ESD precautions



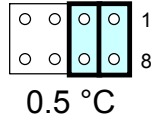
**Electrostatic discharge may damage electrostatic sensitive devices. When handling electrostatic sensitive devices, use always a static-dissipative mat and a static-dissipative wrist wrap.**

- 4.3 If you modify an Incubator with a yellow skin-temperature socket on the left side of the Incubator housing:  
Please verify the correct setting of the skin temperature deviation alarm on the received Analog PCB (P/N 2M 22 404, P/N 2M 22 405, P/N 2M 22 406, P/N 2M 22 407, or 2M 22 382) according to the steps below (section 4.3.1 or 4.3.2).
- 4.3.1 For Incubator 8000 IC with ThermoMonitoring only (units with SW 21.n)  
Set jumper configuration for X5 on the Analog PCB to:



- 4.3.2 For Incubator 8000 SC/NC without ThermoMonitoring but with one socket for a skin-temperature sensor on the left side of the Incubator housing:

Set jumper configuration for X5 on the Analog PCB to:



Note: If necessary please take a jumper from the removed PCB Analog.

- 4.4 For the installation of the Analog PCB and the EPROM use the attached instructions "Skin-Temperature Measurement Conversion Instructions (Incubator 8000 IC/SC/NC)".

Please check before closing the Incubator's cover plate below the Control Unit:

- CPU PCB in the Control Module according to TSB Incubator 8000 IC/SC/NC # 12.
- Disconnect the auxiliary fan (if available) on the Power Pack PCB in the Control Module according to TSB Incubator 8000 IC/SC/NC # 17.

Please note: This is the only fan in the Control Unit.

- 4.5 For testing electrical safety use the attached instructions "Incubator 8000 IC/SC/NC, Electrical Safety Test in the USA and Canada according to CAN/CSA - 22.2 No. 601.1 - M90".
- 4.6 Adhere 2 warning labels according to the enclosed instructions "Adhesive statement 2M22363".
- 4.7 Fill out feedback form and send it back by fax. Please send the original feedback form back with the replaced parts.

## 5 Address for sending back replaced parts

Please send back all replaced parts **with RMA number** as soon as possible to:

Dräger Service  
3124 Commerce Drive  
Trelford, PA 18969

Note: If no RMA # is available please call Customer Service at 1 800 4 DRAGER.

End of Conversion

## Feedback Form Incubator 8000 series / Field Conversion

DrägerService  
 Andreas Lenke  
 3122 Commerce Drive  
 Telford, PA 18969

**1-215-721-5789**

Hospital name and address:			
Name: _____			
Department: _____			
Street: _____			
City: _____		State: _____	Zip: _____
Tel.: _____			
Fax.: _____			
Name of device: <input type="checkbox"/> Incubator 8000 IC <input type="checkbox"/> Incubator 8000 SC <input type="checkbox"/> Incubator 8000 NC		Part No. Incu. (number on rating plate under "Typ"):  	
		Serial No. Incu. (number on rating plate under "Fabr. Nr."): A R ____ - ____	
This is to confirm the following conversion of the Incubator:			
<input type="checkbox"/> The following updated PCB Analog has been installed:			
P/N: _____		S/N: A R ____ - ____ (if available)	
<input type="checkbox"/> Correct EPROM (Software) has been installed:			
SW version: _____		S/N: A R ____ - ____	
<input type="checkbox"/> Correct CPU PCB according to Follow Up TSB # 12 has been installed			
<input type="checkbox"/> Fan on the Power PCB has been disconnected according to TSB # 17			
<input type="checkbox"/> 2 warning labels according to TSB # 19 are placed on the device			
Your Name (please print):	Title:	Date:	Signature:

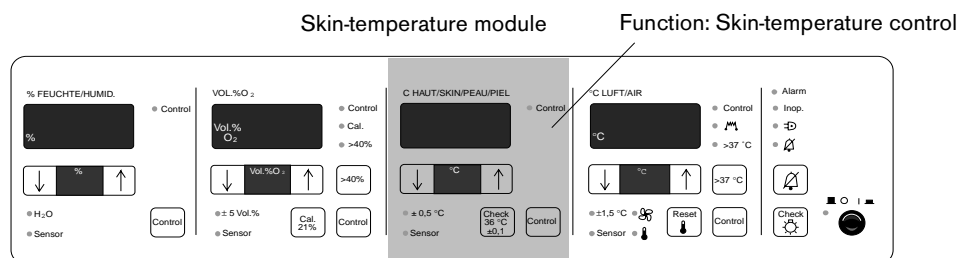


# 1 Skin-Temperature Measurement Conversion Instructions (Incubator 8000 IC/SC/NC)

## 1.1 General Information

- Perform the "skin-temperature measurement" conversion only if the Incubator 8000 IC/SC/NC is equipped with a skin-temperature module.

### 1.1.1 Incubator 8000 IC/SC/NC with skin-temperature control



**Fig. 1:** Front view of the Incubator's control unit with skin-temperature control

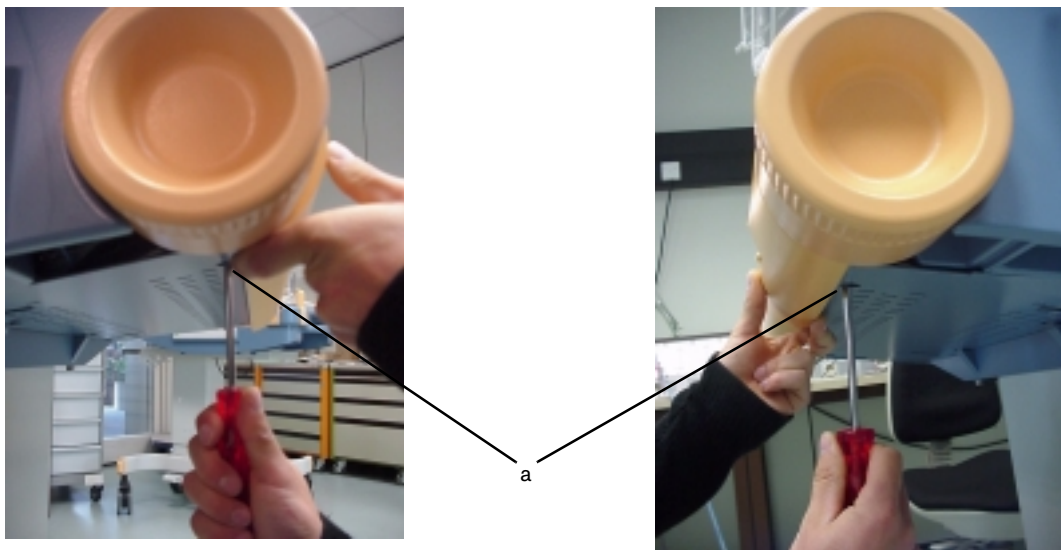
## 1.2 Conversion Procedure

1. Move electrical height adjustment (optional) of the Incubator 8000 IC/SC/NC to the highest position.
2. Switch off the Incubator 8000 IC/SC/NC using the ON/OFF switch.
3. Unplug the power plug of the Incubator 8000 IC/SC/NC from the mains socket-outlet.



**Electrostatic discharge may damage electrostatic sensitive devices. When handling electrostatic sensitive devices, use a static-dissipative mat and a static dissipative wrist strap.**

4. Observe ESD precautions.
5. Support the Incubator's cover plate with one hand and turn catches (a) 90° counter-clockwise.



**Fig. 3:** Left and right side view of the Incubator 8000 IC/SC/NC

6. Unlock latches (b) of the electronic module and fold down the electronic unit.

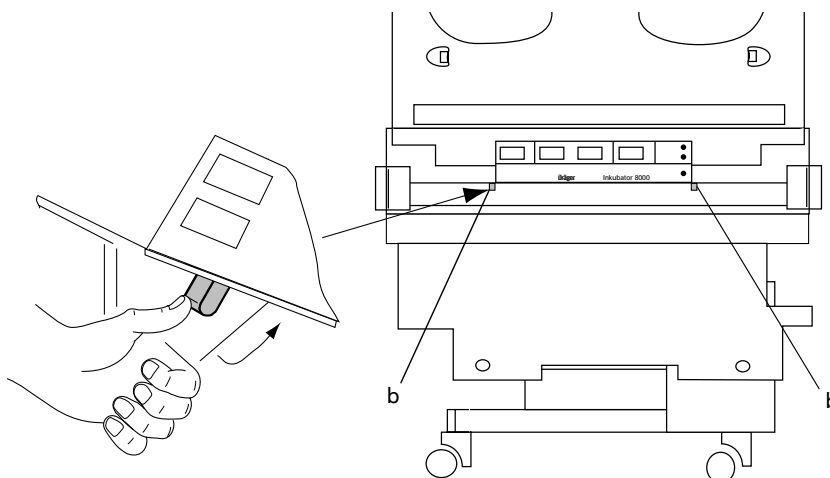


Fig. 4: View of the Incubator 8000 IC/SC/NC



**Risk of damage to equipment. The electronic unit is connected with the Incubator's cables which might be damaged during disassembly. To avoid damage to these cables, carefully remove the electronic unit as shown in the following step.**

7. Remove the following cable connectors from the electronic unit:
- Disconnect cable connectors of the protective conductors (c) from the housing frame of the electronic unit.
  - Take the cable connector (d) by the connector and disconnect it from the Analog PCB.
  - Take the cable connector (e), if present, by the connector and disconnect it from the Analog PCB.

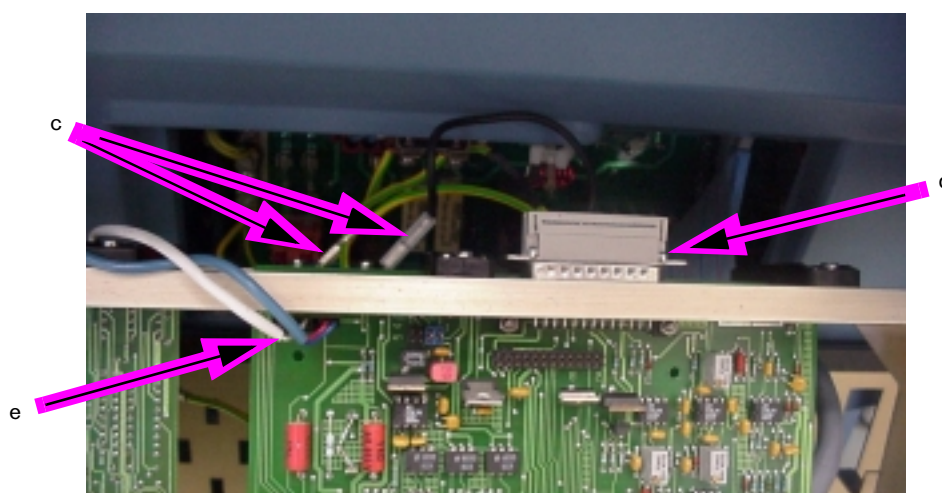
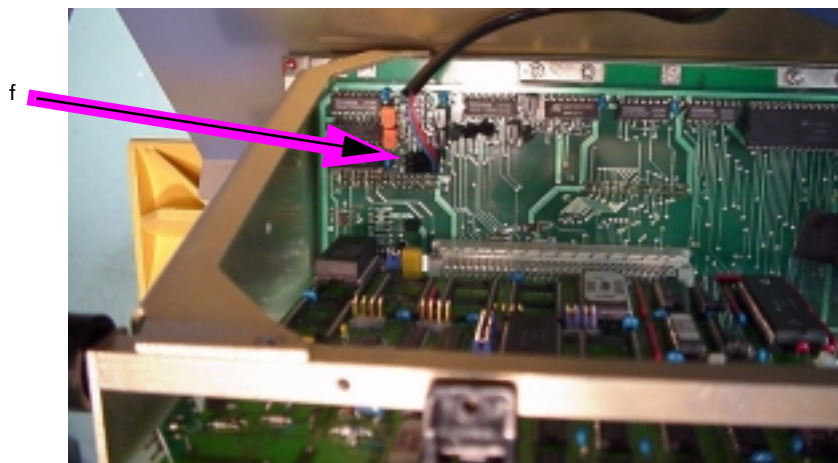


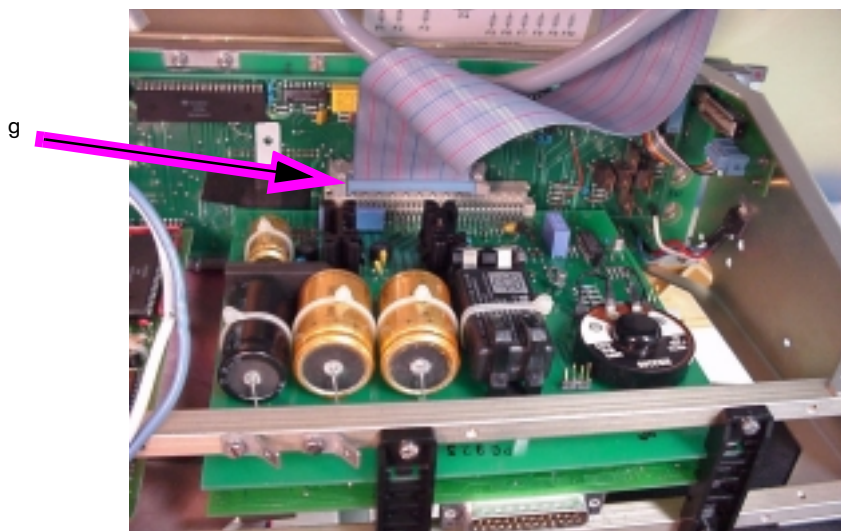
Fig. 5: Cable connections of the electronic unit

8. Carefully remove the electronic unit and disconnect the cable connector of the auxiliary fan (f) (Note: The cable connector of the auxiliary fan is located on the left side of the Motherboard PCB).



**Fig. 6:** Detail of the Motherboard PCB

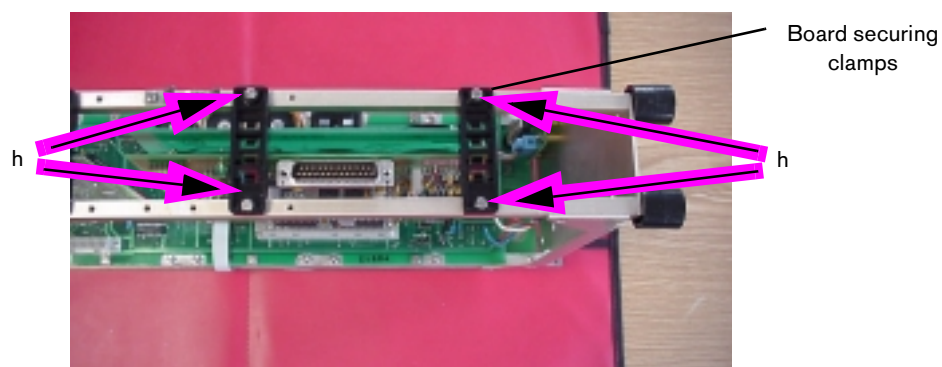
9. Disconnect cable connector (g) from the Motherboard PCB; to do so press both latches of the cable connectors sideways at the same time.



**Fig. 7:** Right side view of the electronic unit

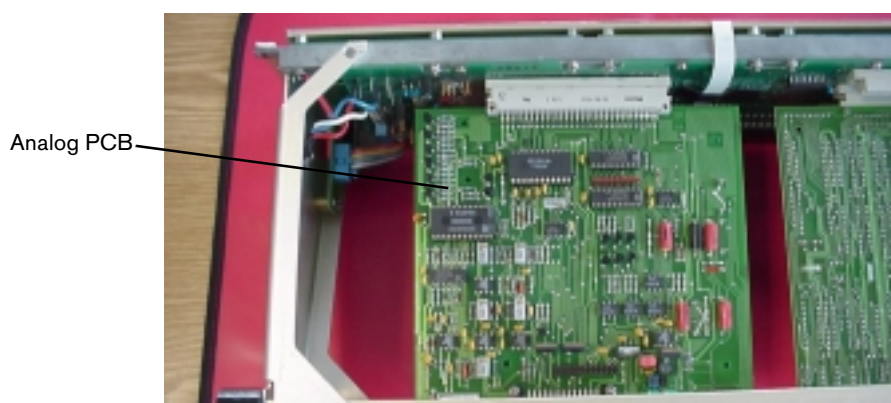
10. Place the electronic unit on a stable surface.

11. Unscrew screws (h) and remove board securing clamps.



**Fig. 8:** Removing the board securing clamps

12. Pull the Analog PCB out of the Motherboard PCB.

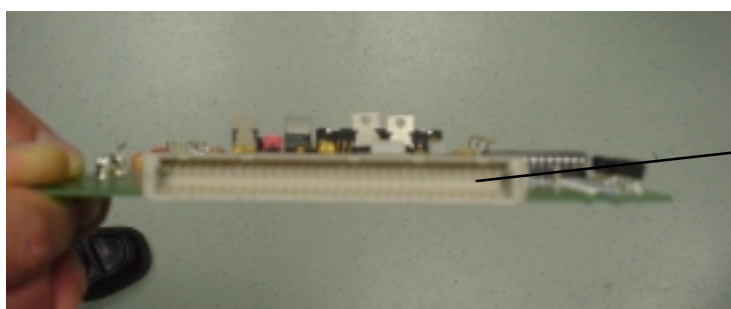


**Fig. 9:** Removing the Analog PCB

13. Place the Analog PCB aside.  
14. Take the modified Analog PCB from the conversion kit.

Skin-temperature control with a single yellow socket	Skin-temperature control (Socket: on environmental sensor or on rear panel)	Thermomonitoring
2M22404-00, or	2M22400-00, or	2M22404-00, or
2M22405-00, or	2M22401-00, or	2M22405-00, or
2M22406-00, or	2M22402-00, or	2M22406-00, or
2M22407-00, or	2M22403-00, or	2M22407-00, or
2M22382	2M22381	2M22382

15. Check that the connecting pins of the Analog PCB terminal strip are straight; if necessary, carefully straighten out the connecting pins.

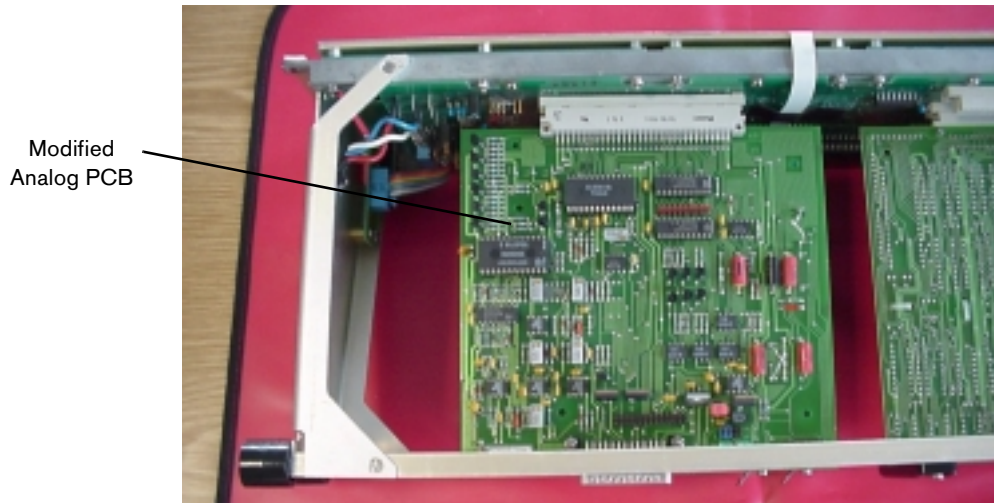


Connecting pins of  
the board terminal  
strip

**Fig. 10:** View of the Analog PCB terminal strip

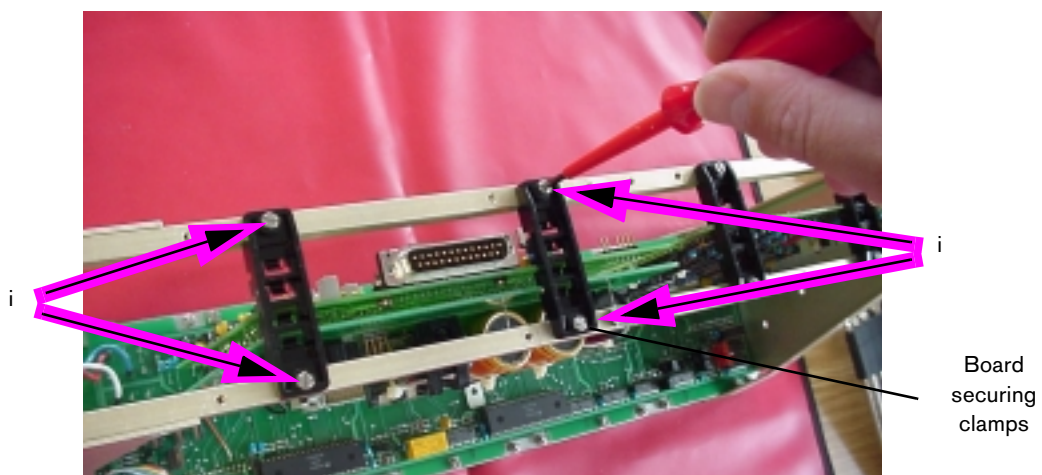


16. Mount the modified Analog PCB on the electronic unit by pushing the Analog PCB into the slot of the Motherboard PCB.



**Fig. 11:** Mounting the modified Analog PCB

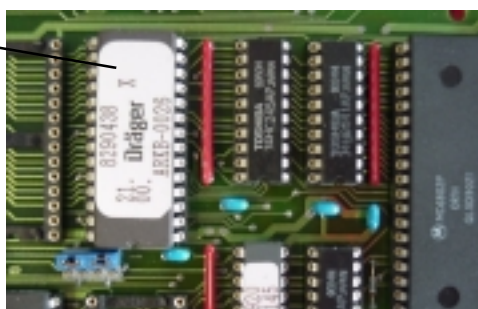
17. Place the board securing clamps (the guides pointing downwards) onto the frame of the electronic unit such that the boards are secured in the guides of the board securing clamps.
18. Secure the board securing clamps to the frame of the electronic unit using the screws (i).



**Fig. 12:** Securing the board securing clamps to the frame of the electronic unit

19. Check the software version of the EPROM located on the CPU PCB (Note: The software version is printed on the adhesive label).
20. If the installed software version is lower than those shown in the table below, take the respective EPROM from the conversion kit and install it on the CPU PCB (Note: Make sure the fitting position of the EPROM is correct, see the following Figure).

Adhesive label on the  
EPROM



**Fig. 13: EPROM**

Software version to be installed	
10.05	11.02
20.04	21.02

**i**

Examples:

Replace software versions 10.00 through 10.04 with software version 10.05.

Replace software version 21.00 or 21.01 with software version 21.02.

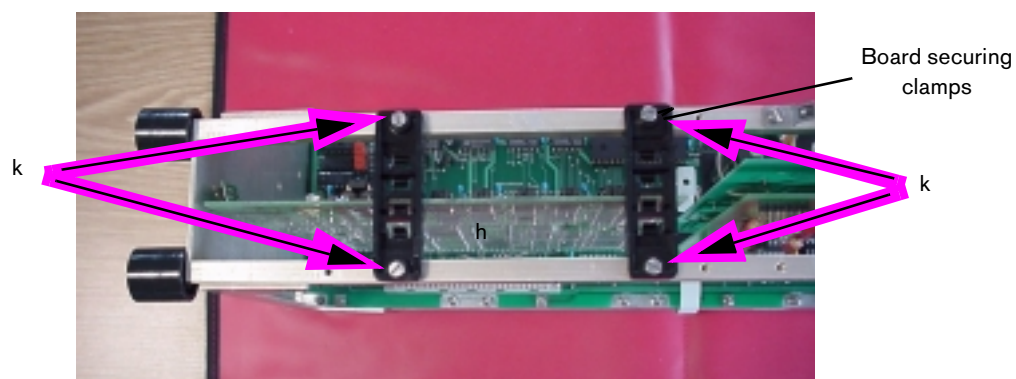
Replace software version 11.00 or 11.01 with software version 11.02.

Replace software version 21.00 or 21.01 with software version 21.02.

21. You do not need to replace the EPROM if the correct software version with the correct revision number is installed on the CPU PCB. Assemble the Incubator, see steps [31](#).
22. If the existing software version on the CPU PCB has an earlier software revision number, replace the software version of the EPROM. Then proceed as follows:

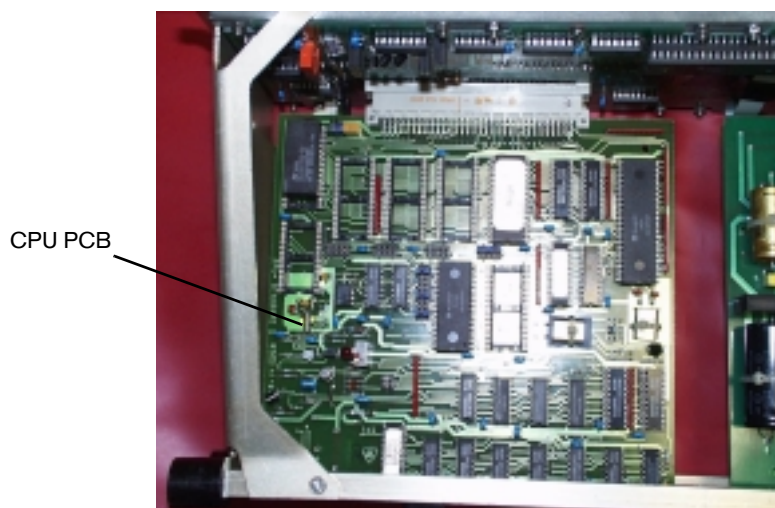


23. Remove screws (k) and place board securing clamps aside.



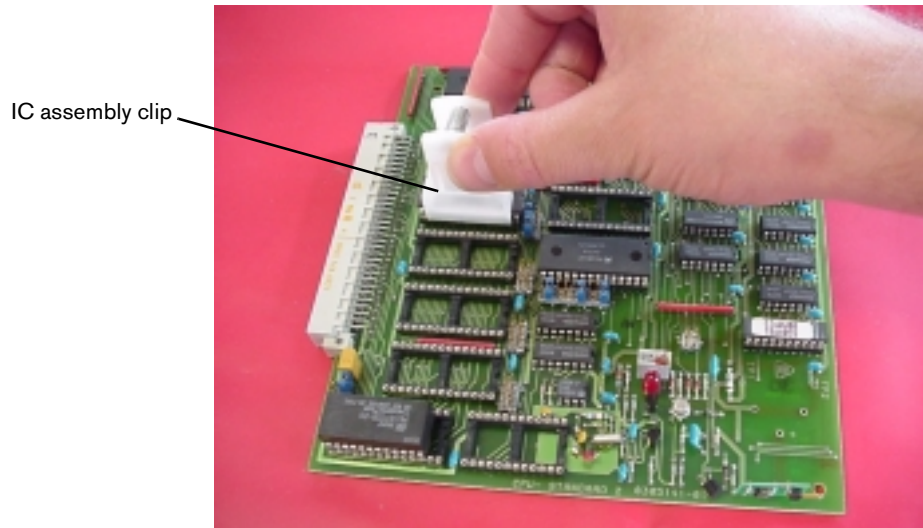
**Fig. 14:** Removing the board securing clamps

24. Carefully pull the CPU PCB out of the Motherboard PCB.



**Fig. 15:** Removing the CPU PCB

25. Remove the EPROM from its socket (preferably with an IC assembly clip) and place the EPROM aside.

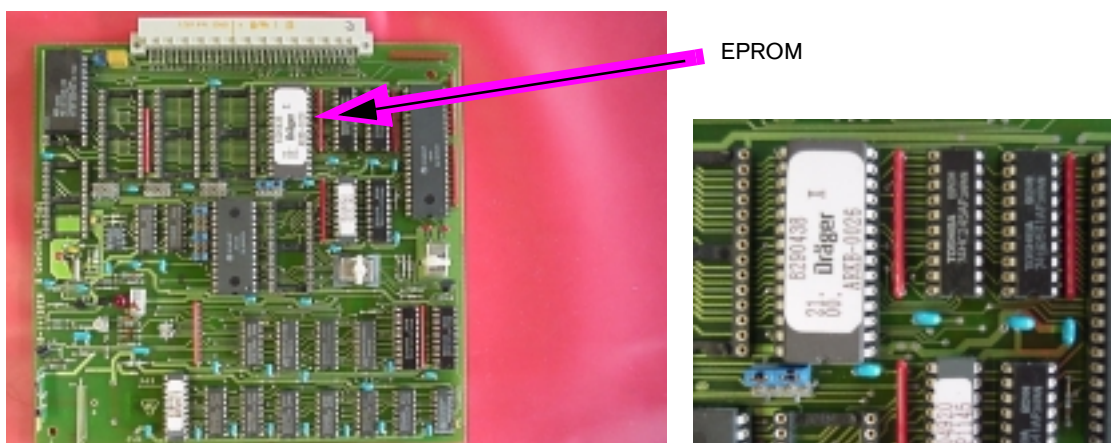


**Fig. 16:** Removing the EPROM from the CPU PCB.



**Risk of malfunction.** The Incubator will malfunction if the EPROM is mounted incorrectly. To avoid malfunctions, make sure the EPROM is fitted correctly into the IC socket, see the following Figure.

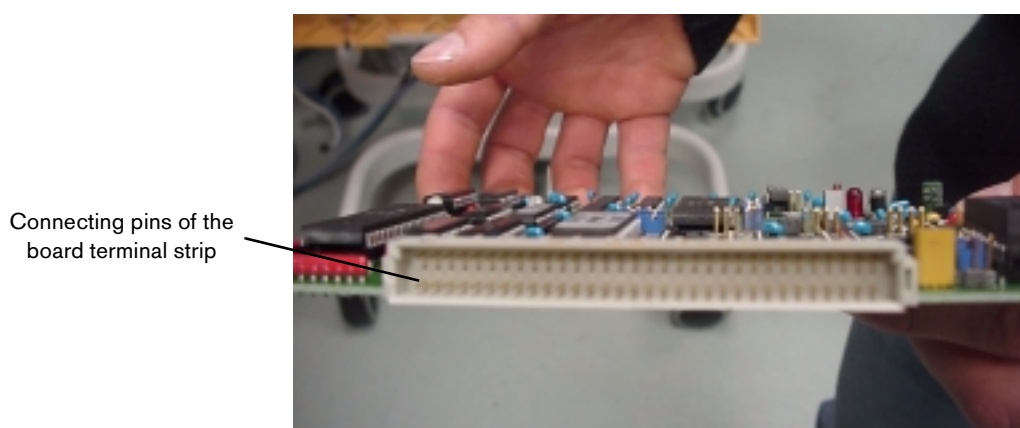
26. Take the necessary EPROM from the conversion kit (see the following table) and fit the EPROM correctly into the respective socket (preferably by using an IC assembly clip).



**Fig. 17:** EPROM on the CPU PCB; fitting position of the EPROM

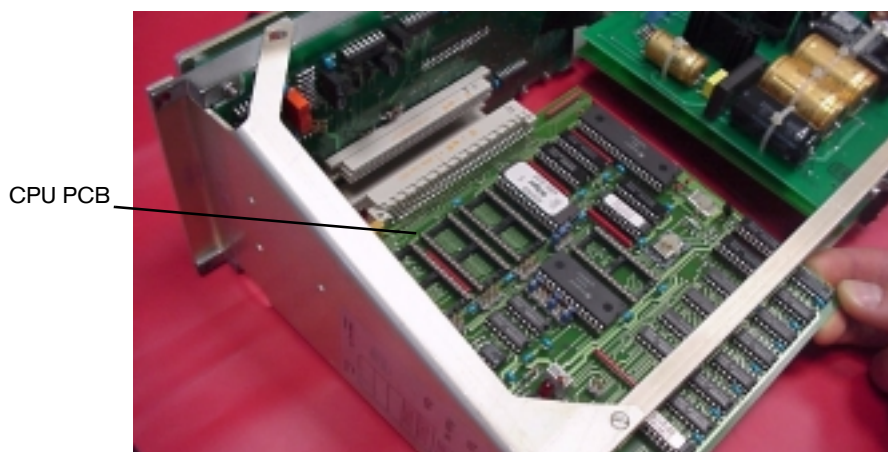
Software version to be installed	
10.05	11.02
20.04	21.02

27. Check that the connecting pins of the CPU PCB terminal strip are straight; if necessary, carefully straighten out the connecting pins.



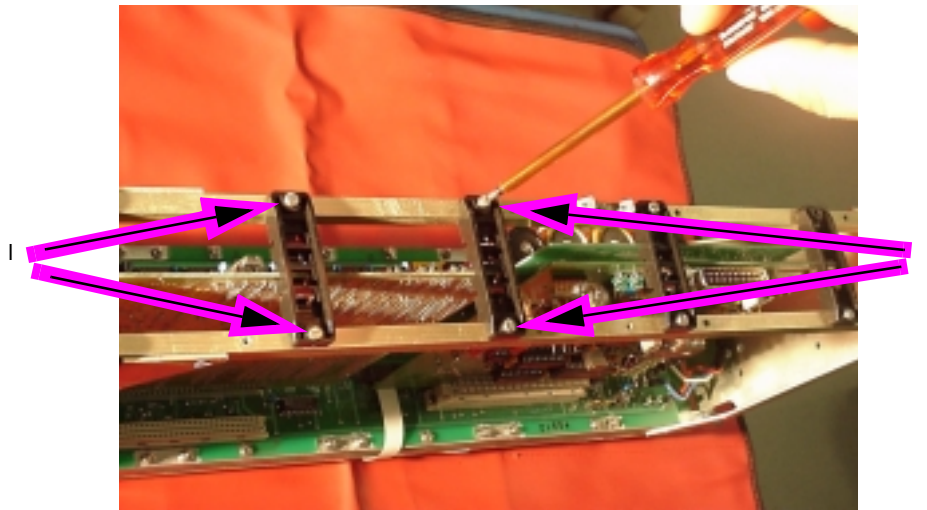
**Fig. 18:** Checking the connecting pins

28. Mount the CPU PCB on the electronic unit by pushing the CPU PCB into the slot of the Motherboard PCB.



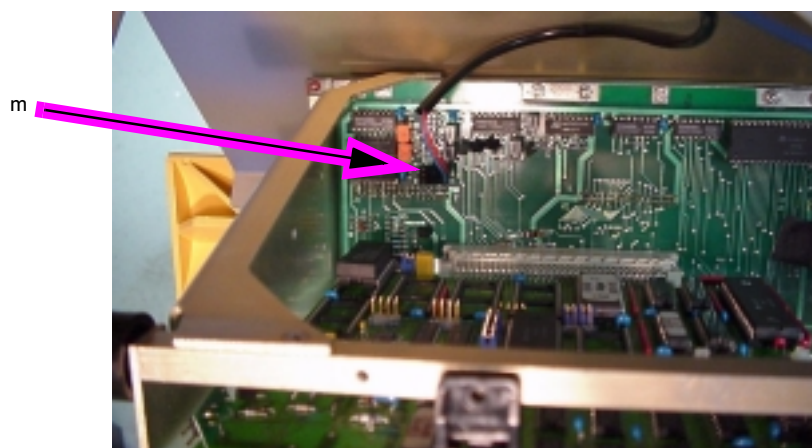
**Fig. 19:** Mounting the CPU PCB

29. Place the board securing clamps (the guides pointing downwards) onto the frame of the electronic unit such that the boards are secured in the guides of the board securing clamps, see the following Figure.
30. Secure the board securing clamps to the frame of the electronic unit using the screws (l).



**Fig. 20:** Securing the board securing clamps to the frame of the electronic unit

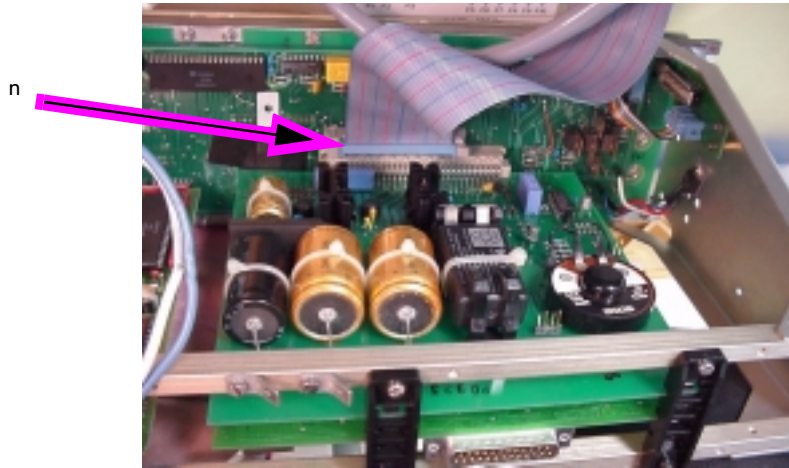
31. Place the electronic unit in front of the Incubator and connect the auxiliary fan connector (m) from the cooling fan in the blue Incubator housing to the connection of the Motherboard PCB (Note: The connection is located on the left side of the Motherboard PCB).



**Fig. 21:** Auxiliary fan connector



32. Push the cable connector (n) onto the connection of the Motherboard PCB until both latches engage.



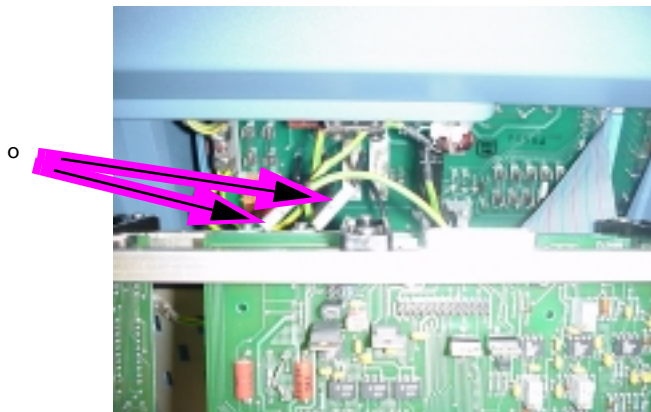
**Fig. 22:** View of the electronic unit

33. Fit the electronic unit into the Incubator by suspending the electronic unit on the guides of the Incubator, see the following Figure.



**Fig. 23:** Fitting the electronic unit

34. Connect cable terminals (o) of the protective conductors to the cable connectors on the housing frame of the electronic unit.



**Fig. 24:** Detail of the housing frame of the electronic unit

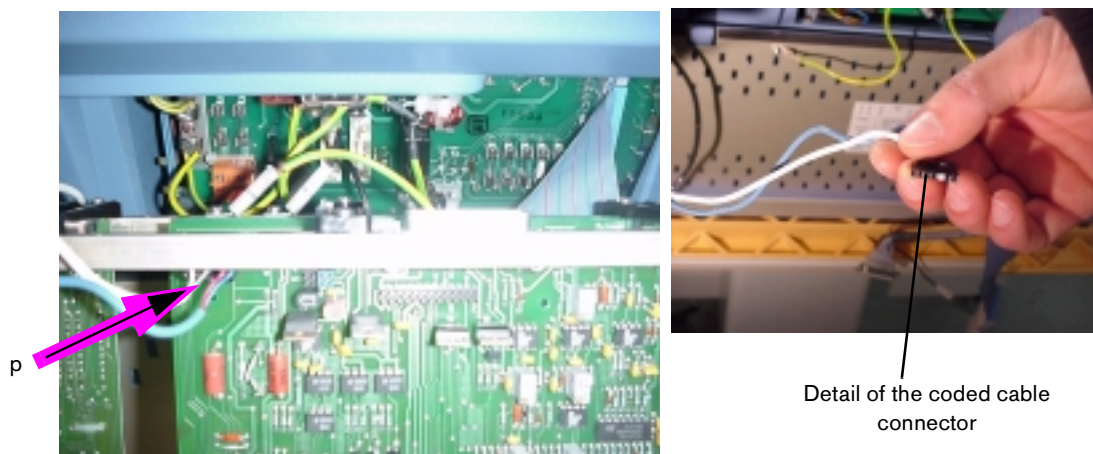


**Risk of damage to equipment. The connecting cable of the skin-temperature sensors might be squeezed if installed incorrectly inside the Incubator. To avoid squeezing of the connecting cable of the skin-temperature sensor, install the connecting cable as shown in the following Figure.**

35. Connect cable connector (p), if fitted, to the Analog PCB (pay attention to the coding).

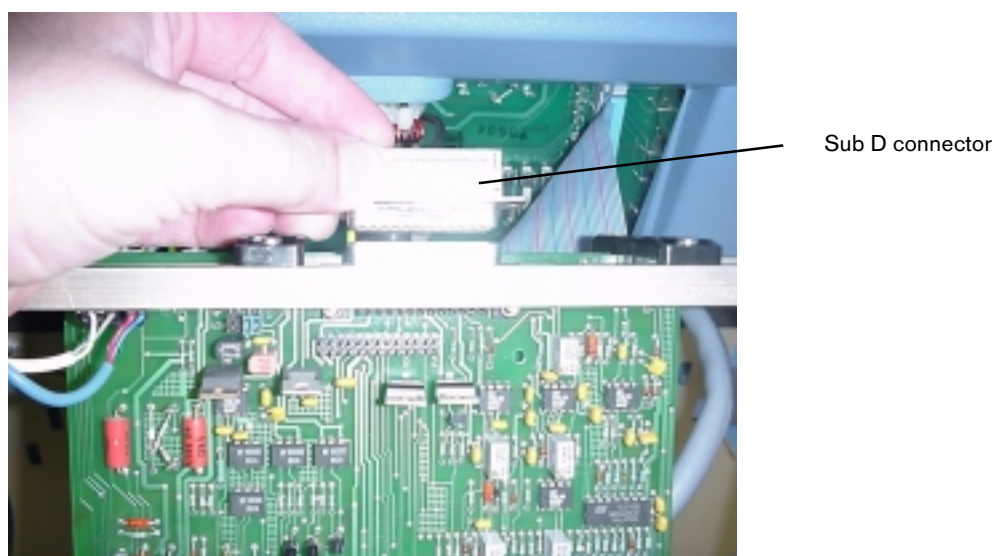


Only on units with a yellow skin-temperature socket fitted on the left side of the blue housing of the Incubator.



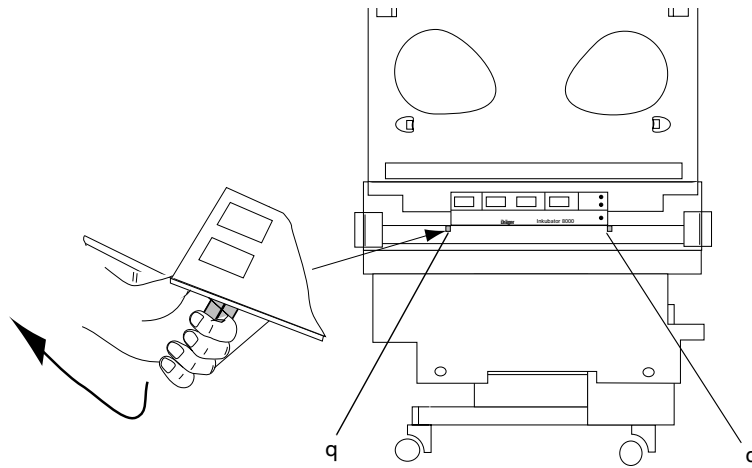
**Fig. 25:** Mounting the cable connector; coding of the cable connector

36. Connect the sub D connector to the Analog PCB.



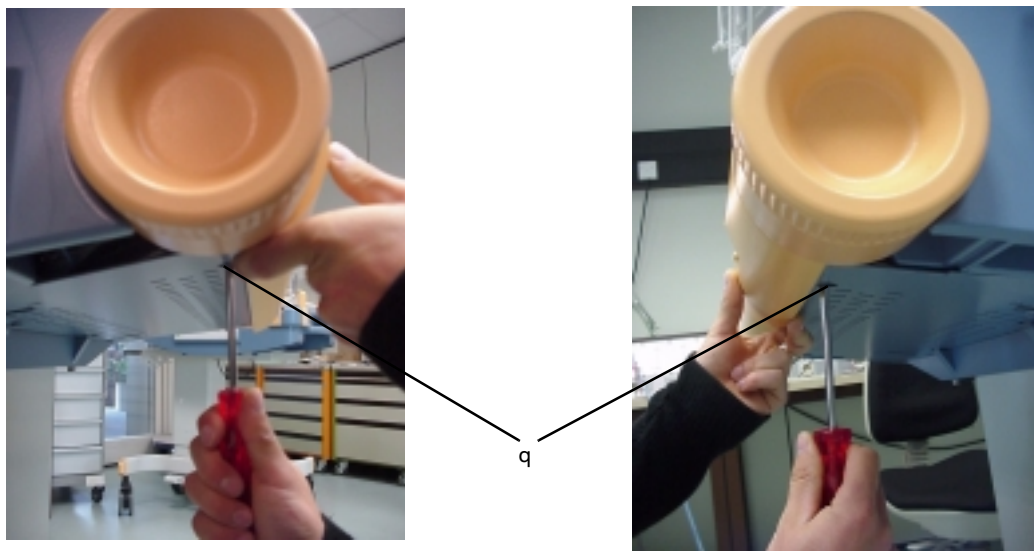
**Fig. 26:** Analog PCB

37. Make sure no cable is squeezed, then fold up the electronic unit and secure it to the Incubator using the latches (q).



**Fig. 27:** Mounting the electronic unit

38. Fold up the Incubator's cover plate and secure it to the Incubator by turning the catches (q) 90° clockwise.



**Fig. 28:** Left and right side view of the Incubator 8000 IC/SC/NC

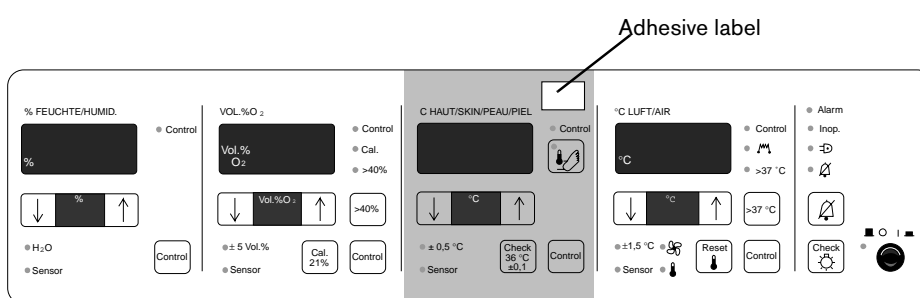
39. Check the electrical safety of the Incubator 8000 IC/SC/NC according to the Test Certificate or Test List or, for the USA and Canada, according to CAN/CSA - 22.2 No. 601.1 - M90.
40. Plug the power plug of the Incubator 8000 IC/SC/NC into the mains socket-outlet.



41. Switch on the Incubator 8000 IC/SC/NC using the ON/OFF switch.

The Incubator 8000 IC/SC/NC carries out a self test and should not display any error message on the 7-segment-display.

42. To check the Incubator 8000 IC/SC/NC, see the "Checking readiness for operation" section in the respective Instructions for Use/Operating Instructions.
43. Switch off the Incubator 8000 IC/SC/NC using the ON/OFF switch.
44. Take the adhesive label (2M22384) from the conversion kit and attach to the control unit as shown in the Figure below.



**Fig. 29:** Front view of the control unit

45. Place the dismantled Analog PCB in a shock-protected and electrostatic discharge protected package (if applicable, pack the EPROM separately from the Analog PCB).
46. Fill out the reply/feedback form and return it together with the dismantled Analog PCB and the EPROM to the sender stated in the head of the reply form.



Re-use bag and packing of dismantled components adequately.

47. Place Incubator 8000 IC/SC/NC to the owner's disposal.



## Follow up Technical Service Bulletin # 12

<b>Product:</b>	<b>Incubator 8000 IC / SC / NC</b>
<b>Date:</b>	November 30, 1999
<b>Re:</b>	<b>Follow up validation of replacement of CPU PCB Incubator 82 90 571 - 00</b>
<b>Reference Doc:</b>	Technical Bulletin TB#004-96, dated July 15, 1996
<b>Reason:</b>	Improved reliability with CPU Incubator PCB P/N 82 90 571 as of revision number 01.0 or higher.
<b>Solution:</b>	All CPU PCBs 82 90 571 with revision number 00 must be replaced by CPU PCBs 82 90 571 with revision number 01.0 or higher.
<b>Devices affected:</b>	<p>All Incubators 8000 SC, IC, and NC with the following serial numbers: ARFA - 0001 (January 1993) to ARJB - 9999 (February 1995).</p> <p>or</p> <p>Incubators 8000 SC, IC, NC which have been repaired with the CPU Incubator PCB 82 90 571 - 00 since January 1993.</p>
<b>When:</b>	At next Service Call or Preventive Maintenance. This action was to be completed by October 31, 1996. Please verify that all units have been corrected.
<b>Reporting:</b>	To Dräger Medical, Inc. by Fax (215) 723 - 5935 by the end of October 31, 2000.
<b>Additional Info:</b>	<p>The following CPU PCBs can be used in the Incubator 8000 series:</p> <ul style="list-style-type: none"><li>• CPU Incubator PCB P/N 82 90 571 with revision number 01.0 or higher.</li></ul> <p>or</p> <ul style="list-style-type: none"><li>• CPU Standard 2 PCB P/N 83 05 141</li></ul>

Identification: In order to identify the type of board installed it is necessary to open the plate underneath the electronics module. The boards are identified by a label on the 64 pin plug connector of the CPU PCB (order no., revision number, and serial number). Unlike boards with 00 revision numbers, the 82 90 571 boards with revision number 01.0 or higher have a small additional board (28.6 mm x 28.6 mm or 1.1 inch x 1.1 inch) with a quartz and an IC.

**Cost:** Parts free of charge

**Ordering Info:** CPU Incubator PCB 82 90 571

**Distribution:** Dräger Service Personnel and Authorized Service Organizations for NCS products.

If you have any questions, please contact Technical Support by phone at 1-800-543-5047 or by fax at 1-215-723-5935

Dräger Medical, Inc.  
Technical Product Manager

Andreas Lenke

## Technical Service Bulletin # 17

<b>Product:</b>	<b>Incubator 8000 IC / SC / NC</b>
<b>Date:</b>	November 30, 1999
<b>Re:</b>	<b>Noise produced by the auxiliary fan on the PCB Power Pack</b>
<b>Reference Doc:</b>	IDM no. 21 / 07.98
<b>Reason</b>	Occasionally the auxiliary fan on the PCB Power Pack (82 90 461) produces too much noise.
<b>Solution</b>	Cut the cable connecting the auxiliary fan and the PCB at both ends, thus physically removing the connection completely. The disconnection of the auxiliary fan on the PCB Power Pack produces no relevant safety risks.
<b>Devices affected:</b>	Incubator 8000 series shipped prior to July 1998 with a Power Pack PCB with an auxiliary fan.
<b>When:</b>	At next Service Call or Preventive Maintenance
<b>Additional Info:</b>	N/A
<b>Cost:</b>	N/A
<b>Ordering Info:</b>	N/A
<b>Distribution:</b>	Dräger Service Personnel and Authorized Service Organizations for NCS products.

If you have any questions, please contact Technical Support by phone at 1-800-543-5047 or by fax at 1-215-723-5935

Dräger Medical, Inc.  
Technical Product Manager

Andreas Lenke



## Incubator 8000 IC / SC / NC Technical Service Bulletin # 19

**Re:** Retrofitting of warning labels

**Update:** May 31, 2000

**Reference Doc:** Complaint # 980046

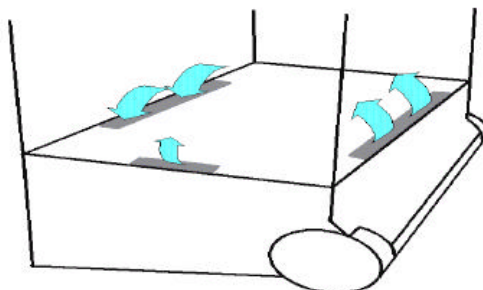
**Reason:** Patient Safety and Incubator Performance may be seriously compromised if air flow passages are not kept clear of obstruction (blankets, surgical drapes, stuffed animals, etc.) during clinical use. Additionally, when the access panel is open, a curtain of warm air flows along the front of the mattress towards the top of the hood. Because the temperature of this air curtain is higher than the typical incubator air temperature, the infant and all its extremities must be kept clear of this warm air path.

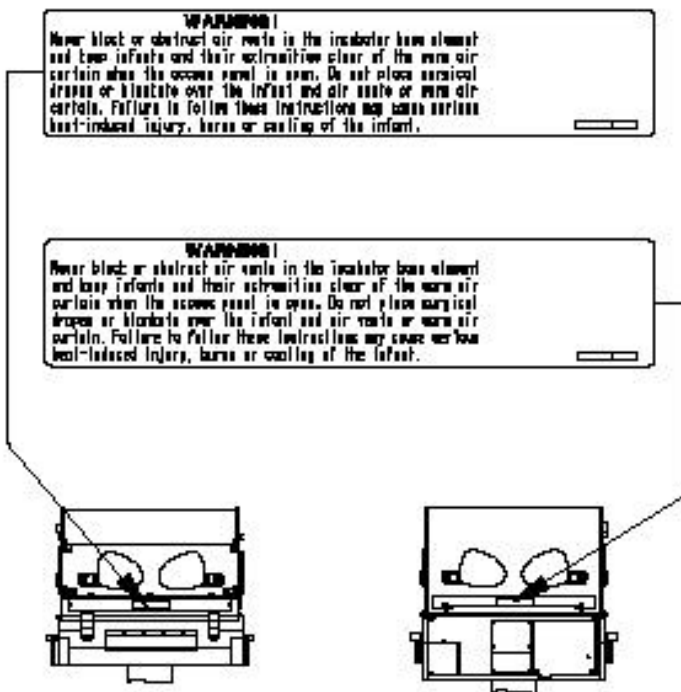
**Solution:** The following warning shall be added to the Operating Instructions and labeling of the Incubator 8000 IC, Incubator 8000 SC, and Incubator 8000 NC:

1. The letter "Important Information for Users of Dräger Incubator 8000 IC/SC/NC" is to be filed in the Operating Instructions of each unit.
2. A warning label is to be placed on the front and on the back face of the mattress stretcher according to the following Instruction "Adhesive Statement 2M22363".

### **WARNING!**

Never block or obstruct air vents in the incubator base element and keep infants and their extremities clear of the warm air curtain when the access panel is open. Do not place surgical drapes or blankets over the infant and air vents or warm air curtain. Failure to follow these instructions may cause serious heat-induced injury, burns or cooling of the infant.





**Devices affected:** All units in the USA and Canada delivered prior May 2000.

**When:** At next Service Call or Preventive Maintenance.

**Additional Info:** As always, it is essential that the Customers train each potential user so that all are adept in properly and safely using the incubator.

**Cost:** Labels free of charge.

**Ordering Info:** For one Incubator order 2 pieces:  
Warning label Incubator P/N 2M 22 351

**Distribution:** Dräger Service Personnel and Authorized Service Organizations for CCS products.

If you have any questions, please contact Technical Support by phone at 1-800-543-5047 or by fax at 1-215-721-5789

Dräger Medical, Inc.  
Technical Product Manager

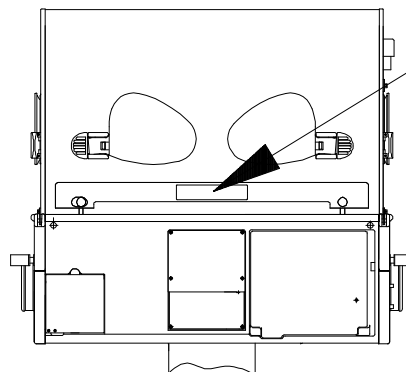
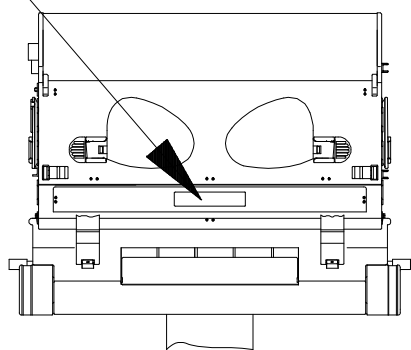


**WARNING !**

Never block or obstruct air vents in the incubator base element and keep infants and their extremities clear of the warm air curtain when the access panel is open. Do not place surgical drapes or blankets over the infant and air vents or warm air curtain. Failure to follow these instructions may cause serious heat-induced injury, burns or cooling of the infant.

**WARNING !**

Never block or obstruct air vents in the incubator base element and keep infants and their extremities clear of the warm air curtain when the access panel is open. Do not place surgical drapes or blankets over the infant and air vents or warm air curtain. Failure to follow these instructions may cause serious heat-induced injury, burns or cooling of the infant.



Adhesive label on bed (not on hood!) as shown above.  
Adhesive area free of fat



## **Incubator 8000 IC / SC / NC**

### **Electrical Safety Test in the USA and Canada according to CAN/CSA - 22.2 No. 601.1 - M90**

#### **1 Visual inspection of basic unit**

- Power cord
- Compare fuses to stated ratings on the backside of the Incubator next to the inlet of the power cord.

#### **2 Safety testing Incubator 8000 IC / SC / NC with Biotek Model 501**

- Fold down flap below electronics module after undoing the two locks.
- **Warning:** These tests can expose personnel to hazardous electric shock and must be carried out with caution.
- **Note:** Do not plug the Biotek 501 Pro safety analyzer power cord into a line isolation monitor as inaccurate readings may occur.
- Plug the Biotek 501 Pro power cord into a live AC receptacle, place the power switch of the Biotek 501 Pro to the "1" or ON position and ensure that the keys marked "GROUND", "NEUTRAL" and "POLARITY" are in the NORMAL position.
- **Note:** If the corresponding red LEDs for Ground, Neutral, and Polarity are not lit, they are in the normal position.

##### **2.1 Chassis Resistance Testing**

- Attach the ground lead from the red "Test lead" input to the ground hole of the AC test receptacle on the Biotek 501 Pro. Select the "Single lead" condition by ensuring that the "SINGLE/DUAL" key is not illuminated. Press the gray key marked "RESIST", then press the blue key marked "CAL". When the word CAL is no longer shown in the display window of the Biotek 501 Pro, you may proceed.
- Remove the red lead from the ground hole of the AC test receptacle and attach the alligator clip to the free end, leaving the other end plugged into the red "Test lead"

input of the Biotek 501 Pro with the "Single Lead" and "Resistance" conditions still selected.

- Plug the Incubator power cord into the test receptacle of the Biotek 501 Pro.
- Perform 4 tests with the alligator clip attached to the following test items of the Incubator:



1) Screw at the base plate of electrical height adjustment (if available)



2) Screw at the metal base plate below Incubator housing



3) Earth chassis connection of the flap below electronics module



4) Electronics module, earth chassis connection

- The resistance reading then shown on the Biotek 501 Pro is the "Chassis Resistance". Bend and exercise the power cord to check for intermittent reading.
- Maximum allowable test values:

Chassis Resistance	0.2 Ohm
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- Afterwards leave alligator clip at test item 4) or attach the alligator clip to the test item with the lowest resistance.

## 2.2 Enclosure Leakage Current (Chassis Leakage Testing)

- Press the gray "LEAKAGE" key, leaving all other selections from the previous test the same.
- Switch on Incubator and allow the unit to complete the self-test.
- Switch on humidity module.
- Set air temperature and humidity higher than measured values.
- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lit, they are in the normal position.
- This is a measurement of the leakage current from the Chassis to earth ground.
- Activate height adjustment (if available) during the following tests.
- Maximum allowable test values under Normal Condition:

Normal Ground, Normal Polarity, Normal Neutral:	100 $\mu$ A
Normal Ground, Reverse Polarity, Normal Neutral:	100 $\mu$ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Normal Neutral:	500 $\mu$ A, but not 0 $\mu$ A
Open Ground, Reverse Polarity, Normal Neutral:	500 $\mu$ A, but not 0 $\mu$ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

### 2.3 Earth Leakage Current (Ground Wire Leakage Testing)

- Remove the red lead with the alligator clip from the Incubator.
- Remove the alligator clip from the red test lead and plug this end into the green input jack "GROUND" on the back panel on the Biotek 501 Pro.
- Leave all other selections from the previous test the same.
- The Incubator is still switched on.
- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lit, they are in the normal position.
- This is a measurement of the leakage current flowing through the ground wire of the power cord.
- Activate height adjustment (if available) during every following test.
- Maximum allowable test values under Normal Condition:

Open Ground, Normal Polarity, Normal Neutral:	500 $\mu$ A, but not 0 $\mu$ A
Open Ground, Reverse Polarity, Normal Neutral:	500 $\mu$ A, but not 0 $\mu$ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Open Neutral:	1000 $\mu$ A
Open Ground, Reverse Polarity, Open Neutral:	1000 $\mu$ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Switch off Incubator.

## 2.4 Patient leakage current from the skin temperature connection to earth

- Remove the test lead from the Biotek 501 Pro and leave all other selections from the previous test the same.
- Units with one or two skin temperature connections on the left side of Incubator housing:  
Short all pins of the two skin temperature connectors using a shorting plug 79 10 484. Plug the other end into the input jack "RA" of the Biotek 501 Pro.
- Units without ThermoMonitoring:  
Short all pins of the skin temperature connector by using the
  - a) Skin Temperature Sensor Simulator 79 01 236 with the switch in "REXT" position. Short the two yellow "REXT" outlets from the simulator and connect "REXT" to the input jack "RA" of the Biotek 501 Pro.

or

  - b) Use Adapter 2M 20 736 and short a sensor connector as a test lead to the safety tester. Plug the other end into the input jack "RA" of the Biotek 501 Pro.
- Select the "ECG LEAK" key on the Biotek 501 Pro.
- Use the Increment or Decrement arrow on the Biotek 501 Pro to select the "RA-Gnd" option.
- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Switch on Incubator.
- Maximum allowable test values under Normal Condition:

Normal Ground, Normal Polarity, Normal Neutral:	100 $\mu$ A
Normal Ground, Reverse Polarity, Normal Neural:	100 $\mu$ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Normal Neutral:	500 $\mu$ A
Open Ground, Reverse Polarity, Normal Neutral:	500 $\mu$ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Switch off Incubator and disconnect power cord from the Biotek 501 Pro and remove the test equipment
- Close flap below electronics module.





DrägerService®

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